EPA/ROD/R04-91/079
1991

EPA Superfund
Record of Decision:

PETROLEUM PRODUCTS CORP.
EPA ID: FLD980798698
OU 01
PEMBROKE PARK, FL
10/05/1990

OCTOBER 5, 1990 GREER C. TIDWELL
REGIONAL ADMINISTRATOR

#SLD
1.0 SITE LOCATION AND DESCRIPTION

THE PPC SITE IS LOCATED IN PEMBROKE PARK, FLORIDA, APPROXIMATELY 0.2 MILES WEST OF INTERSTATE 95, 1.5 MILES NORTH OF THE BROWARD COUNTY-DADE COUNTY LINE. THE AREA SURROUNDING THE SITE IS HIGHLY DEVELOPED AND CONTAINS A HIGH-DENSITY RESIDENTIAL POPULATION IN ADDITION TO A VARIETY OF COMMERCIAL/INDUSTRIAL ACTIVITIES. THE SITE LIES WITHIN THE RADIUS OF INFLUENCE OF TWO MAJOR MUNICIPAL WELL FIELDS: THE HALLANDALE MUNICIPAL WELL FIELD, APPROXIMATELY 2000 AND 3700 EAST OF THE SITE, AND THE HOLLYWOOD MUNICIPAL WELL FIELD, LESS THAN TWO MILES NORTHWEST OF THE SITE. A THIRD PROPOSED WELLFIELD FOR BROWARD COUNTY WILL BE LOCATED APPROXIMATELY 7500 FEET WEST OF THE SITE. SEE FIGURES 1-1 AND 1-2.

THE SITE CURRENTLY IS OCCUPIED BY A COMMERCIAL/INDUSTRIAL WAREHOUSE COMPLEX KNOWN AS THE PEMBROKE PARK WAREHOUSES. A FENCED AREA IN THE SOUTHEASTERN PORTION OF THE SITE IS THE ONLY AREA OF THE PREVIOUS PPC FACILITY THAT HAS BEEN LEFT UNPAVED. THE FENCED AREA CONTAINS A FEW DRUMS OF WASTE GENERATED DURING THE RI FIELDWORK AND AN OIL RECOVERY SYSTEM WELL. THIS WELL HAS RECOVERED APPROXIMATELY 6900 GALLONS OF OIL SINCE 1985. REFER TO FIGURE 1-3.

#SH
2.0 SITE HISTORY

PPC HAS BEEN REPORTED TO HAVE STARTED OPERATIONS IN 1958. IN SEPTEMBER 1958, SEVERAL TANKS WERE STAGED AN AREA BOUNDED ON THE EAST AND NORTH BY LARGE AREAS OF STANDING WATER SERVING AS A DRAINAGE SYSTEM. FROM 1966 TO 1968, PPC WAS EXPERIENCING MAXIMUM OPERATION AS A REFINERY OF WASTE OILS. DURING THIS TWO YEAR PERIOD THE RESIDENTS IN THE AREA BEGAN COMPLAINING OF OVERFLOW OF THE OILS ONTO THE TRAILER PARK PROPERTY LOCATED ADJACENT TO AND SOUTH OF THE SITE.

IN 1970, PPC INITIATED MAJOR CHANGES IN ITS OPERATION AFTER A LARGE RAINFALL CAUSED THE DISPOSAL PIT TO OVERFLOW, PRODUCING AN OIL SLICK ON THE TRAILER PARK LAKES. AFTER INCREASED COMMUNITY PRESSURE AT THE TIME OF THE SPILL, PPC BEGAN PREPARATIONS TO SELL THE PROPERTY. THE DISPOSAL PITS WERE FILLED IN AND IT IS SUSPECTED THAT THE SLUDGES WERE MIXED IN WITH CLEAN FILL, RETURNED TO THE PIT AND/OR SPREAD OVER THE PROPERTY.

IN 1971, PPC ENDED THE OPERATION OF REFINING THE WASTE OILS AND BEGAN OPERATING AS A STORAGE AND DISTRIBUTION FACILITY. MR. JERRY BLAIR, OWNER AND OPERATOR OF THE PPC FACILITY, SOLD THE MAJORITY OF THE PROPERTY TO DR. ROBERT CORNFELD, WHO HOLDS THE PROPERTY IN FOUR LAND TRUSTS OF WHICH HE IS THE BENEFICIARY. THE SOUTHEASTERN CORNER OF THE PROPERTY IS STILL OWNED BY THE PETROLEUM PRODUCTS CORPORATION.

WAREHOUSES WERE CONSTRUCTED BY PPC AND DR. CORNFELD ON THE NORTHERN AND WESTERN SECTIONS OF THE PROPERTY. SITE CONDITIONS HAVE REMAINED ESSENTIALLY THE SAME FROM 1972 TO 1984.

IN 1979, PPC CLEANED UP PORTIONS OF THE SITE IN RESPONSE TO TWO WARNING NOTICES FROM BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD. THE TWO OIL-SOAKED AREAS AND REHABILITATING TWO OTHER AREAS. IN 1983, THE FDER SOUTHEAST FLORIDA DISTRICT OFFICE ISSUED A NOTICE OF VIOLATION REQUESTING THAT PPC REMOVE ADDITIONAL WASTE OILS FROM THE SITE AND SUBMIT A DETAILED SAMPLING ANALYSIS PLAN. PPC HIRED DAMES AND MOORE, INC., AN ENVIRONMENTAL CONSULTING FIRM, TO CONDUCT SAMPLING AT THE SITE. THE SAMPLING REVEALED A LAYER OF OIL FLOATING ON THE GROUNDWATER TABLE. IN ADDITION, THE GROUNDWATER CONTAINED VARYING AMOUNTS OF OIL AND GREASE, PETROLEUM HYDROCARBONS, VOLATILE ORGANIC COMPOUNDS, AND SEVERAL INORGANIC COMPOUNDS. IN 1984, FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (FDER) HIRED ENVIRONMENTAL SCIENCE AND ENGINEERING, INC. (ESE) TO

DETERMINE THE EXTENT OF FREE HYDROCARBON CONTAMINATION AT THE PPC SITE. ESE ESTIMATED THAT 20,000 TO 60,000 GALLONS OF FREE OIL WAS PRESENT IN A GROUNDWATER PLUME CENTERED ON THE TANK FARM AREA. THE PLUME APPEARED TO BE SLOWLY MIGRATING TO THE EAST-SOUTHEAST. THE EXTENSIVE SATURATION OF THE SOILS WITH OIL HAS BEEN ATTRIBUTED TO THE FLUCTUATION OF THE WATER TABLE.

IN 1985, EPA COLLECTED SAMPLES FROM THE STORAGE TANKS ON-SITE AND AN AREA AWAY FROM THE TANKS. THE SAMPLES EXHIBITED LEVELS OF LEAD (244 PPM), OIL AND GREASE (1,000,000 PPM), AND TOLUENE AT (240 PPM). EPA ISSUED AN ADMINISTRATIVE ORDER TO PPC ON MARCH 1, 1985. PPC AGREED TO WORK UNDER A CONSENT ORDER WHERE PPC WOULD UNDERTAKE THE REQUIRED CLEANUP ACTION UNDER THE DIRECTION OF AN EPA ON-SCENE COORDINATOR.

THE ORDER STATED THAT ALL TANKS WERE TO BE EMPTIED, CLEANED AND RENDERED INOPERABLE; ALL OIL, WATER AND SLUDGES WERE TO BE CHEMICALLY TESTED PRIOR TO DISPOSAL; THE OIL PROPERLY DISPOSED OF OR RECYCLED; AND THE ASBESTOS IN THE BOILER HOUSE REMOVED OR ENCAPSULATED. TWO HUNDRED SIXTY-TWO DRUMS OF SLUDGE WERE REMOVED FROM THE PROPERTY IN OCTOBER, 1985.

IN 1985, FDER HIRED A CONTRACTOR TO INSTALL A FREE-PRODUCT RECOVERY SYSTEM WHICH CONSISTED OF A 30-INCH DIAMETER, 23-FOOT-DEEP EXTRACTION WELL, WITH A 25 GALLON-PER MINUTE (GPM) DRAWDOWN PUMP AND AN OIL SKIMMING UNIT FOR THE RECOVERY OF FLOATING OIL UNDERNEATH THE SITE. THE RECOVERY SYSTEM HAS BEEN IN OPERATION SINCE 1985, AND HAS RECOVERED APPROXIMATELY 6900 GALLONS OF OIL TO DATE.

IN 1986, FDER CONTRACTED ECOLOGY AND ENVIRONMENT TO PREFORM THE RI/FS FOR THE SITE. THE RI INDICATED THAT CONTAMINATION WAS STILL PRESENT AT THE PPC SITE. THE DRAFT FS WAS PRESENTED TO EPA IN MARCH, 1988. EPA WAS UNABLE TO ACCEPT THE FS AS FINAL BEFORE FDER EXPENDED ALL FUNDING AVAILABLE FOR THE FS. FDER AND EPA ARE JOINTLY INVESTIGATING THE REMEDY SELECTION WITH PLANS TO PRESENT A SOIL AND GROUNDWATER CONTAMINATION REMEDIAL ACTION IN 1991.

#HCP

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

THE RI AND INTERIM ACTION PROPOSED PLAN FOR THE PETROLEUM PRODUCTS CORPORATION SITE WERE RELEASED TO THE PUBLIC IN JULY 1990. THESE DOCUMENTS WERE MADE AVAILABLE TO THE PUBLIC IN BOTH THE ADMINISTRATIVE RECORD, AND IN INFORMATION REPOSITORIES MAINTAINED AT THE EPA DOCKET ROOM IN REGION 4 AND AT THE BROWARD COUNTY MAIN LIBRARY. THE NOTICE OF AVAILABILITY FOR THE DOCUMENTS WAS PUBLISHED IN THE SUN SENTINEL ON AUGUST 1, 1990. A PUBLIC COMMENT PERIOD WAS HELD FROM JULY 31, 1990 THROUGH AUGUST 30, 1990. IN ADDITION, A PUBLIC MEETING WAS HELD ON AUGUST 14, 1990. AT THIS MEETING, REPRESENTATIVES FROM EPA AND FDER ANSWERED QUESTIONS ABOUT PROBLEMS AT THE SITE AND THE REMEDIAL ALTERNATIVES UNDER CONSIDERATION. EPA GRANTED A 30 DAY EXTENSION TO THE PUBLIC COMMENT PERIOD IN RESPONSE TO REQUESTS FROM THE POTENTIAL RESPONSIBLE PARTY'S. THE PUBLIC COMMENT PERIOD ENDED ON SEPTEMBER 30, 1990. A RESPONSE TO THE COMMENTS RECEIVED DURING THIS PERIOD IS INCLUDED IN THE RESPONSIVENESS SUMMARY, WHICH IS PART OF THIS INTERIM ACTION RECORD OF DECISION. THIS DECISION DOCUMENT PRESENTS THE SELECTED INTERIM REMEDIAL ACTION FOR THE PPC SITE, IN PEMBROKE PARK, FLORIDA, CHOSEN IN ACCORDANCE WITH CERCLA, AS AMENDED BY SARA AND, TO THE EXTENT PRACTICABLE, THE NATIONAL CONTINGENCY PLAN. THE DECISION FOR THIS SITE IS BASED ON THE ADMINISTRATIVE RECORD.

#SROU
4.0 SCOPE AND ROLE OF THE OPERABLE UNIT

THE MAJOR GOAL OF THIS INTERIM ACTION IS TO CONTAIN THE PLUME WITHIN THE BOUNDARIES OF THE SITE. PREVENTING FURTHER WATER INFILTRATION INTO THE AREA OF THE DISPOSAL PITS BY PREVENTING INFILTRATION OF WATER INTO THE SOILS AND INCREASING THE RECOVERY OF WASTE OIL FROM THE GROUNDWATER. THERE ARE A NUMBER OF WELLS THAT WERE INSTALLED ON-SITE IN THE PAST THAT HAVE DEGRADED. THESE WELLS ARE NOT USEFUL FOR MONITORING OR PUMP AND TREAT ACTIVITIES. THE WELLS ARE SOURCES OF INFILTRATION OF STORMWATER AND COMMERCIAL WASTEWATER FROM THE SITE. DRAINAGE ON THE SITE CONSISTS OF A FRENCH DRAIN SYSTEM RELIEVING RUN-OFF OVER THE ENTIRE PROPERTY. THESE DRAINS ALLOW FOR FLUSHING OF THE FORMER PPC DISPOSAL PIT CONTAMINATION INTO THE GROUNDWATER.

THE WAREHOUSE COMPLEX AND SURROUNDING AREA SUPPORT A VARIETY OF SMALL COMMERCIAL/INDUSTRIAL OPERATIONS. MANY OF THE CURRENT OPERATIONS USE SOLVENTS AND OTHER CHEMICALS THAT REPRESENT A CONTINUING SOURCE OF SOIL AND GROUNDWATER CONTAMINATION VIA LEAKAGE FROM THE SURFACE WATER DRAINAGE SYSTEM OR DIRECT INFILTRATION IN UNPAVED AREAS. AREA BUSINESSMEN HAVE STATED THAT SMALL-SCALE DUMPING OF INDUSTRIAL CHEMICALS IS COMMON IN THIS AREA.

THE PPC SITE AND THE SURROUNDING NEIGHBORHOOD ARE IN A TOPOGRAPHICALLY FLAT AREA WHICH RESULTS IN A DRAINAGE PROBLEM. EXTENSIVE LOCAL PONDING OCCURS AFTER PERIODS OF SUBSTANTIAL RAINFALL. THE PROPERTY OWNER OF THE PPC SITE INSTALLED A DRAINAGE SYSTEM FOR THE PROPERTY WHICH CONSISTS OF A NUMBER OF DRAINAGE WELLS AND STORM SEWERS. THE INTAKE OF SOME OF THESE WELLS EXTENDS ABOUT ONE FOOT ABOVE THE COLLECTION SUMP, WHICH ESSENTIALLY SKIMS THE WATER. THE DRAINS ARE ACTUALLY FRENCH DRAINS ALLOWING STORMWATER CONTAINING WASTE OILS FROM THE PPC SLUDGE PITS AS WELL AS DUMPED WASTEWATER FROM THE INDUSTRIES WITHIN THE WAREHOUSES TO BE RELEASED DIRECTLY INTO THE GROUNDWATER. A METHOD BY WHICH THE DRAINS AND WELLS ARE CLOSED OUT WHILE THE RUN OFF FROM THE SITE IS DIVERTED TO ANOTHER AREA WOULD SLOW DOWN THE WATER INFILTRATION AS WELL AS LIMIT THE FLUSHING EFFECT THE WELLS AND DRAINAGE SYSTEM HAVE ON THE CLOSED DISPOSAL PITS.

INOPERABLE WELLS IN THE IMMEDIATE PLUME VICINITY ARE POTENTIAL PATHWAYS FOR MIGRATION OF CONTAMINANTS FROM THE SHALLOW SOILS. IDENTIFICATION OF DAMAGED OR INOPERABLE WELLS SHOULD BE CONDUCTED AND THOSE WELLS DECOMMISSIONED. THIS INTERIM REMEDIAL ACTION WILL BE CONSISTENT WITH ANY PLANNED FUTURE ACTIONS, TO THE EXTENT POSSIBLE. SOURCE CONTROL AND GROUNDWATER TREATMENT WILL BE ADDRESSED AS A SUBSEQUENT OPERABLE UNIT.

THE FDER RI REPORT PRESENTED TO EPA PROVIDES INFORMATION TO INDICATE THAT THE FOLLOWING ACTIVITIES SHOULD BE IMPLEMENTED AT THE SITE:

- DISCONTINUE ON-SITE, SMALL-SCALE DUMPING BY AREA BUSINESSES;
- MODIFY THE SURFACE DRAINAGE SYSTEM;
- MODIFY THE FREE-PRODUCT RECOVERY SYSTEM;
- POST LOCAL WELLS; AND
- DECOMMISSION NON-OPERATING WATER AND MONITORING WELLS.

IN WAREHOUSE NUMBER 261, LOCATED NORTHWEST OF THE CENTER OF THE FORMER DISPOSAL PIT, FREE OIL WAS FOUND TO HAVE SEEPED FROM THE GROUND UPWARD THROUGH THE FLOOR. A CONCRETE DIKE OF ABOUT 1 SQUARE YARD WAS INSTALLED IN THE WAREHOUSE TO CONTAIN THE OIL. SEE PHOTO # 1.

THE PRESENT WASTE OIL RECOVERY SYSTEM SHOULD BE IMPROVED TO RECOVER MORE OF THE WASTE OIL FROM THE GROUNDWATER. NUMEROUS OPERATION AND MAINTENANCE PROBLEMS HAVE PREVENTED THE SYSTEM FROM ACHIEVING MAXIMUM RECOVERY RATES.

#SC
5.0 SITE CHARACTERISTICS

THE PETROLEUM PRODUCTS CORPORATION SITE FORMERLY CONTAINED A TANK FARM AND TWO UNLINED DISPOSAL PITS. SOIL, SEDIMENT, GROUNDWATER AND SURFACE WATER SAMPLES WERE COLLECTED IN AND AROUND THE SITE. ALTHOUGH THE REMEDIAL INVESTIGATION (RI) IDENTIFIED AREAS OF CONTAMINATION, IT DID NOT SUFFICIENTLY DEFINE THE EXTENT OF CONTAMINATION IN THE GROUNDWATER AND SOILS. THE TREATABILITY STUDIES PRESENTED IN THE FS WERE ALSO NOT SUFFICIENT TO DETERMINE WHICH ALTERNATIVE WOULD BEST SUIT THE SOURCE CONTROL AT THE SITE. THEREFORE, EPA AND THE STATE OF FLORIDA HAVE BEGUN STUDIES AND SAMPLING ACTIVITIES TO DETERMINE THE APPROPRIATE ALTERNATIVE FOR THE SECOND OPERABLE UNIT REMEDY. THE REMEDY FOR SOURCE CONTROL OR CONTAMINATED SOIL REMEDIATION WILL BE SET FORTH IN A SEPARATE RECORD OF DECISION AND WILL BE CONDUCTED AS A SECOND OPERABLE UNIT AT THE SITE. THE FIRST OPERABLE UNIT WILL FOCUS ON CONTAINMENT OF THE PLUME FROM THE SITE INTO SURROUNDING AREAS.

5.1 SOIL GAS INVESTIGATION

SOIL GAS SAMPLING WAS PERFORMED TO DETERMINE THE EXTENT OF HYDROCARBON CONTAMINATION IN THE VADOSE ZONE AND SHALLOW GROUNDWATER. SAMPLING LOCATIONS IN ADDITION TO THOSE SAMPLES THAT EXHIBITED A GAS CHROMATOGRAPH (GC) PEAK ARE INDICATED ON FIGURE 3-1. THE DATA FROM THIS SURVEY WAS UTILIZED IN DETERMINING THE AREAS FOR SOIL SAMPLING AND PLACEMENT OF GROUNDWATER MONITORING WELLS. EXAMINATION OF THE RESULTS PRESENTED IN TABLE 1 DID NOT REVEAL ANY CLEAR PATTERN AS TO GC PEAK TYPES. THERE WAS VERY LITTLE CORRELATION BETWEEN GC PEAK AND THE DOWN-PIPE READINGS OR THE OPEN-HOLE READINGS. SOME SAMPLES THAT EXHIBITED HIGH OPEN-HOLE READINGS DID NOT EXHIBIT GC PEAKS AND SOME SAMPLES THAT EXHIBITED GC PEAKS DID NOT EXHIBIT HIGH DOWN-PIPE READINGS. DESPITE THE PROBLEMS, THE SOIL GAS SURVEY PROVIDES AN INDICATOR OF AREAS MOST LIKELY CONTAMINATED WITH THE EXCEPTION OF SAMPLES 1A, 3A, 41, 55 AND 51.

5.2 OIL SAMPLING

TWO OIL SAMPLES, PWS01 AND DUPLICATE PSW01D, WERE COLLECTED FROM A CONCRETE IMPOUNDMENT. THE IMPOUNDMENT, IN WAREHOUSE 261, HAD BEEN CONSTRUCTED TO RESTRAIN THE SPREADING OF OIL THAT SEEPED THROUGH THE WAREHOUSE FLOOR TO A DEPTH OF ONE TO TWO FEET. FIGURE 3-2 SHOWS THE OIL SAMPLE LOCATION.

LEAD (2,050 PARTS PER MILLION (PPM)), CALCIUM (1,540 PPM), SODIUM (533 PPM), MAGNESIUM (178 PPM) AND BORON (81.5 PPM) WERE DETECTED. THESE CONCENTRATIONS REFLECT THE CALCAREOUS SOILS AND ASSOCIATED GROUNDWATER CONTACT WITH THE REPROCESSED WASTE OIL IN THE SUBSURFACE.

5.3 SURFACE WATER AND SEDIMENT INVESTIGATION

IN GENERAL, LAKE WATERS IN THE AREA EXHIBITED MINIMAL METAL CONTAMINATION. MAGNESIUM, CALCIUM, SODIUM AND BORON WERE THE PRIMARY METALS DETECTED. THE PRESENCE AND DETECTED CONCENTRATIONS OF THESE METALS ARE NOT UNUSUAL, GIVEN THAT THESE MAN-MADE LAKES ARE EXCAVATED CALCAREOUS TERRAIN. LEAD WAS THE PRIMARY METAL CONTAMINANT ASSOCIATED WITH THE PPC SITE AT 8 PARTS PER BILLION (PPB) FROM A SAMPLE FROM THE ORANGE BROOK GOLF COURSE. THE LOCATION OF THE LAKE WATER AND SEDIMENT SAMPLES ARE SHOWN ON FIGURE 3-3. CALCIUM, MAGNESIUM, SODIUM, AND BORON WERE DETECTED IN LAKE SEDIMENT SAMPLES REFLECTING THE CALCAREOUS FRACTION OF THE PEAT-RICH SEDIMENT. ALUMINUM, COPPER, MANGANESE, IRON AND ZINC WERE ALSO PRESENT. LEAD WAS DETECTED IN THE BAMBOO PARADISE TRAILER PARK LAKES LOCATED SOUTH OF THE SITE IN THREE SAMPLES (19.8 PPM, 31.4 PPM, AND 100 PPM). THE LEAD CONCENTRATION FOUND IN THESE LAKES MAY BE ATTRIBUTED TO THE RUNOFF FROM THE DISPOSAL PIT.

SURFACE WATER RUNOFF SAMPLES WERE COLLECTED FROM THREE DRAINAGE CULVERTS ON THE SOUTHERN HALF OF THE SITE. THE DATA SHOWED THAT SURFACE WATER RUNOFF FROM THE SITE INCLUDES A VARIETY OF DISSOLVED CONSTITUENTS. LEAD CONTAMINATION VARIED FROM 198 PPB TO 320 PPB. TPHC WAS ALSO DETECTED AT CONCENTRATIONS OF 8,600 PPB TO 18,000 PPB. CONSEQUENTLY, SURFACE WATER RUNOFF PROVIDES A POTENTIAL PATHWAY OF CONTINUING CONTAMINATION OF SOILS, GROUNDWATER AND SURFACE

WATERS (LAKES).

SOIL INVESTIGATIONS INDICATED THAT ONLY LEAD, ALUMINUM, BARIUM, CHROMIUM, COPPER, IRON, AND ZINC APPEAR TO BE OF SIGNIFICANCE IN THE SOIL CONTAMINATION. LEAD CONCENTRATIONS VARIED IN THE DISPOSAL PIT SOILS FROM 957 PPM TO 7,660 PPM, AND TOTAL ORGANIC COMPOUND (TOC) CONCENTRATIONS RANGED FROM 306 PPM TO 4,652 PPM. REFER TO FIGURES 3-4, 3-5, 3-6, 3-7, 3-8, 3-9 AND 3-10.

5.4 GROUNDWATER

GROUNDWATER BENEATH THE SITE CONSISTS OF THE SURFICIAL ZONE AND INTERMEDIATE ZONE OF THE BISCAYNE AQUIFER, AND FLORIDAN AQUIFER. THE SURFICIAL ZONE IS HEAVILY CONTAMINATED WITH WASTE OIL, LEAD, CHROMIUM, ALUMINUM, IRON, MANGANESE AND BENZENE. THE METALS FOUND IN THE SURFICIAL ZONE ARE ALSO FOUND IN THE INTERMEDIATE AQUIFER AT THE PPC SITE AT LOWER CONCENTRATIONS. THE FLORIDAN AQUIFER AT THE SITE IS NOT CONTAMINATED. THE OFF-SITE SURFICIAL AND INTERMEDIATE ZONES OF THE BISCAYNE AQUIFER WERE FOUND TO BE CONTAMINATED WITH SIMILAR CONTAMINANTS IN THE AREAS SOUTH, EAST AND WEST OF THE PPC SITE.

THE SURFICIAL ZONE IS LOCATED IN THE SOFT LIMESTONE BEDROCK. SOIL BORING RESULTS FROM 20 - 30 FOOT DEPTHS INDICATED THAT THIS LIMESTONE IS INTERBEDDED WITH HIGHER PERCENTAGE OF SAND, SILT, AND SHELL FRAGMENTS.

A DEEP WELL BORING SHOWS LITTLE LITHOLOGIC VARIATION BETWEEN 30 FEET AND 200 FEET. IN DEEP WELLS, DRILLING MUD HAD TO BE ADDED CONTINUALLY TO PREVENT LOSS OF CIRCULATION, SUGGESTING THE PRESENCE OF VOIDS AND CAVITIES. CONTAMINATED WATER FROM THE UPPER AQUIFERS INTO THE FLORIDIAN AQUIFER WILL LIKELY OCCUR IN THE NEAR FUTURE.

5.5 SURFACE SOIL

SURFACE SOIL (0-20 FEET) AT THE PPC SITE IS HIGHLY CONTAMINATED WITH LEAD. HIGH OFF-SITE LEAD CONTAMINATION WAS FOUND AT THE CORNER OF CAROLINA ROAD AND SW 31ST AVENUE (NEAR THE TANK FARM AREA). ARSENIC CONCENTRATIONS WERE OF HEALTH CONCERN AT THE SOUTH AND WEST AREAS OF THE SITE. THE SITE AND SURROUNDING AREAS ARE DEVELOPED AND LANDSCAPED, THEREFORE, INHALATION OF WIND BLOWN CONTAMINATED SOIL IS NOT A CURRENT CONCERN. THIS WOULD BE A CONCERN DURING THE REMOVAL OF CONTAMINATED SOILS FROM THE SITE.

5.6 SURFACE WATER

PEMBROKE PARK IS A RELATIVELY FLAT AREA, WITH A FEW MAN-MADE HIGH-LYING LAND AREAS. THE ELEVATION OF THE PPC SITE WAS RAISED ABOUT 5 INCHES WHEN THE WASTE OIL PIT WAS REFILLED. NO DISPOSAL PONDS OR DITCHES ARE LOCATED ON-SITE. SURFACE WATER AT THE SITE IS COLLECTED BY DRAINAGE WELLS. THE DRAINAGE WATER SHOWED HIGH CONCENTRATIONS OF LEAD AND MODERATE CONCENTRATIONS OF CHROMIUM AND MANGANESE. OFF-SITE SURFACE WATER SAMPLES FROM THE NEARBY TRAILER PARK LAKES, HOWEVER, SHOWED LOW LEVELS OF COPPER, ZINC, AND IRON IN SEVERAL SAMPLES. THE METALS ANALYSES SUGGEST THAT CONTAMINATION ASSOCIATED WITH THE PPC SITE IS NOT CURRENTLY AFFECTING THE WATER QUALITY OF THE SURROUNDING LAKES. THE PPC SITE IS LOCATED IN A FLOODING AREA (THE AVERAGE ANNUAL RAINFALL IS 60 INCHES PER YEAR). THE CONTAMINANTS FOUND MAY BE CARRIED BY SURFACE WATER RUN-OFF INTO THE LAKES AT THE BAMBOO TRAILER PARK, TED'S AQUA GOLF COURSE, AND INTO THE BUSINESS COMPLEX AT THE PPC SITE.

5.7 AIR

ANALYTICAL RESULTS OF AIR SAMPLING ARE NOT REPORTED IN THE REMEDIAL INVESTIGATION. HOWEVER, THE REMEDIAL INVESTIGATION REPORT DID MENTION THAT A STRONG SMELL OF SOLVENTS WERE PRESENT FROM THE OPEN MONITORING WELLS. MONITORING WELLS ARE NORMALLY CAPPED, EXCEPT THE MONITORING/RECOVERY

WELL IN THE FENCED AREA. THE AIR EXPOSURE PATHWAY AT THE PPC SITE HAS NOT BEEN FULLY EVALUATED. DURING REMEDIATION, THE POTENTIAL MAY BE INCREASED FOR THE AIR EXPOSURE PATHWAY TO BECOME AN ENVIRONMENTAL PATHWAY OF CONCERN.

#HEP
6.0 HUMAN EXPOSURE PATHWAYS

THE ABOVE MENTIONED CONTAMINATED ENVIRONMENTAL MEDIA CONSTITUTES THE FOLLOWING POTENTIAL HUMAN EXPOSURE PATHWAYS.

CONTAMINATED GROUNDWATER PRESENTS INGESTION, DERMAL ABSORPTION AND INHALATION EXPOSURE PATHWAYS. SURFICIAL AND INTERMEDIATE ZONES OF THE BISCAYNE WERE SHOWN TO BE CONTAMINATED AT THE PPC SITE, OFF-SITE AREAS, SOUTHWEST, AND EAST OF THE SITE. ACCORDING TO THE FDER FILES, THERE ARE REPORTS THAT PEOPLE BECAME ILL AFTER DRINKING WATER SUPPLIED BY SEVERAL OF THE PRIVATE WELLS IN THE AREA. ALL DRINKING WATER IN THE AREA IS PRESENTLY PROVIDED BY THE HALLANDALE WELL FIELD ACCORDING TO THE FDER REMEDIAL INVESTIGATION REPORT. DERMAL ABSORPTION AND INGESTION OF CONTAMINANTS IN THE GROUND WATER COULD OCCUR TO RESIDENTS IN THE AREA WHO HAVE IRRIGATION WELLS.

#SSR
7.0 SUMMARY OF SITE RISKS

ANALYTICAL RESULTS OF THE REMEDIAL INVESTIGATION INDICATE THAT OFF-SITE CONTAMINATION APPEARS TO BE IN THE GROUNDWATER AND THE SOILS IN THE SOUTH, EAST AND WEST AREAS ADJACENT TO THE SITE. ALUMINUM, CHROMIUM, IRON, LEAD, MANGANESE, TRICHLOROETHYLENE AND ARSENIC ARE THE CONTAMINANTS IN THE OFF-SITE AND ON-SITE AREAS. AT THIS TIME, THE CONTAMINATION FROM THE SITE HAS NOT ENTERED INTO THE WELL FIELDS. HOWEVER, IF THE CONTAMINANTS ARE ALLOWED TO REMAIN, THE POTENTIAL FOR HUMAN EXPOSURE EXISTS.

7.1 ON-SITE CONTAMINATION

CONTAMINANTS OF CONCERN ON-SITE CONSIST OF THE FOLLOWING:

MEDIA	CONTAMINANT	RANGE (UNIT)
SURFICIAL ZONE OF THE BISCAYNE (BLACK OIL IN 18" - 20" THICKNESS)	LEAD	0.0246 - 22,400 PPM
	CHROMIUM	LT 0.01 - 1.1 PPM
	ALUMINUM	0.647 - 376 PPM
	MANGANESE	0.0571 - 0.308 PPM

THE CURRENT MAXIMUM CONTAMINANT LEVEL FOR LEAD IS 50 PPB AND WAS PROMULGATED AS AN INTERIM DRINKING WATER REGULATION IN 1975. IN 1985, EPA BEGAN THE PROCESS OF REVISING THE STANDARD FOR LEAD BY PROPOSING A MAXIMUM CONTAMINANT LEVEL GOAL (MCLG) OF 20 PPB. THE HIGH LEVELS OF LEAD FOUND IN THE SOIL AND GROUNDWATER RAISE SPECIAL CONCERNS THOUGH WE HAVE NO NUMBERS BY WHICH TO QUANTIFY THE RISK FROM EXPOSURE TO LEAD. EPA HEADQUARTERS HAS RECENTLY RECOMMENDED THAT 15 PPB OF LEAD IN DRINKING WATER NOT BE EXCEEDED, DUE TO CENTRAL NERVOUS SYSTEM EFFECTS OCCURRING AT VERY LOW BLOOD LEVELS OF THIS METAL.

7.2 OFF-SITE CONTAMINATION

ANALYTICAL RESULTS OF THE RI INDICATE THAT OFF-SITE CONTAMINATION APPEARS TO BE IN GROUNDWATER AND SOILS IN THE SOUTH, EAST AND WEST AREAS ADJACENT TO THE SITE. THE CONTAMINANTS OF CONCERN CONSIST OF THE FOLLOWING.

MEDIA	LOCATION	CONTAMINANT	RANGE (UNIT) (UG/L)
SURFICIAL ZONE OF THE BISCAYNE AQUIFER	SOUTH	ALUMINUM	44,100 - 202,000
		CHROMIUM	139 - 474
		IRON	11,700 - 27,600
		LEAD	58 - 161
		MANGANESE	77.6 - 99.6
	EAST	CHROMIUM	468
		ALUMINUM	169,000
		IRON	34,600
		LEAD	219
		MANGANESE	99.6
	WEST	ALUMINUM	10,500
		IRON	5,250
		LEAD	1,800
		MANGANESE	97.2
		TRICHLOROETHYLENE	5.1
INTERMEDIATE ZONE OF THE BISCAYNE AQUIFER	SOUTH	ALUMINUM	1,440
		IRON	757
	EAST	ALUMINUM	LT 200 - 2,560
		IRON	175 - 598
SHALLOW SOIL	SOUTH	ARSENIC	LT 1.5 - 4.38
		LEAD	LT 1.5 - 5.090
	EAST	LEAD	3.87 - 1,860
	WEST	ARSENIC	LT 1.55 - 1.58

#DA

8.0 DESCRIPTION OF ALTERNATIVES

ALTERNATIVE 1 - NO ACTION
ALTERNATIVE 2 - RELIEF FROM WATER INFILTRATION
ALTERNATIVE 3 - RELIEF FROM WATER INFILTRATION WITH RECOVERY SYSTEM MODIFICATIONS

THE ALTERNATIVES CHOSEN FOR THIS ACTIVITY PROVIDE FOR A PHASED APPROACH. ALTERNATIVES CHOSEN FOR THIS INTERIM ACTION WILL LIMIT THE AMOUNT OF CONTAMINATION CONTINUING TO BE RELEASED FROM THE SITE.

8.1 ALTERNATIVE 1 - NO-ACTION

ESTIMATED CAPITAL COST:	$ 0
ESTIMATED OPERATION AND MAINTENANCE (O&M):	$ 63,000
MONTHS TO IMPLEMENT:	1 MONTH

THE NO-ACTION ALTERNATIVE IS REQUIRED BY THE NATIONAL CONTINGENCY PLAN (NCP) TO BE CONSIDERED THROUGH THE NINE POINT CRITERIA. IT PROVIDES A BASELINE FOR COMPARISON OF OTHER ALTERNATIVES. UNDER THE NO-ACTION ALTERNATIVE, NO SOURCE CONTROL REMEDIAL MEASURES WOULD BE UNDERTAKEN AT THE PETROLEUM PRODUCTS CORPORATION NPL SITE AT THE PRESENT TIME. POTENTIAL HEALTH RISKS WOULD REMAIN ASSOCIATED WITH CURRENT EXPOSURE BY INGESTION TO SURFACE SOIL AND EXPOSURE TO SURFACE WATER BY INGESTION.

ALTHOUGH NO ACTION WOULD ENTAIL GROUNDWATER MONITORING AS OPERATION AND MAINTENANCE (O&M), UNREMEDIATED SOILS WOULD CONTINUE TO RELEASE CONTAMINANTS INTO THIS CLASS I AQUIFER, THEREBY EXTENDING THE PERIOD OF TIME OVER WHICH THE DRINKING AND GROUNDWATER TREATMENT SYSTEMS WILL BE REQUIRED TO OPERATE AND THE AMOUNT OF SOIL REQUIRING REMEDIATION.

8.2 ALTERNATIVE 2 - RELIEF FROM WATER INFILTRATION

ESTIMATED CAPITAL COST:	$ 480,000
ESTIMATED OPERATION AND MAINTENANCE (O&M):	$ 63,000
MONTHS TO IMPLEMENT:	3 MONTHS

ALTERNATIVE 2 RECOMMENDS DECOMMISSIONING OF NON-OPERATING WATER AND MONITORING WELLS; REDIRECTING THE DRAINAGE FROM THE SITE; CLOSING CULVERT DRAINAGE WELLS THAT ARE ON-SITE; AND, CONDUCTING A PUBLIC WELL SURVEY TO POST WELLS IN THE AREA FOR SAMPLING AND ANALYSIS THE PRESENCE OF CONTAMINANTS IN THE DRINKING WATER. OTHER SITE ACTIVITIES WOULD INCLUDE POSTING WARNING SIGNS IDENTIFYING THE SITE AS AN NPL SITE, PREVENTING ACCESS TO THE CONCRETE DIKE AREA IN THE WAREHOUSE RENTAL UNIT, AND IMPOSITION OF INSTITUTIONAL CONTROLS (LAND USE RESTRICTIONS). THE ACTIVITIES RECOMMENDED WILL DIMINISH THE AMOUNT OF CONTAMINANTS FLUSHING INTO THE GROUNDWATER AND LOCATE CONTAMINATED WATER SOURCES THAT COULD BE PRESENTLY UTILIZED BY THE PUBLIC. AT THE PRESENT TIME, THE STORM DRAINAGE WELLS HAVE AN INTAKE ABOUT ONE FOOT ABOVE THE COLLECTION SUMP WHICH ESSENTIALLY SKIMS THE WATER. THE WASTEWATER AND WASH WATER FROM THE SURROUNDING INDUSTRIAL/COMMERCIAL BUSINESSES FLOWS INTO THE WELLS AND DOWN INTO THE GROUNDWATER, INCREASING THE PROBLEM. LIMITING THE NUMBER OF CONDUITS INTO THE AQUIFER IN THE AREA OF THE DISPOSAL PITS LIMITS THE MOBILITY OF CONTAMINATION INTO THE AREA. THE PUBLIC WELL SURVEY WOULD DEFINE THE NUMBER OF INDIVIDUALS PRESENTLY ON PRIVATE WELLS.

THE TRANSPORTATION AND DISPOSAL OF RECOVERED WASTE OIL FROM THE SITE; DESIGN AND INSTALLATION OF DRAINAGE SYSTEMS FOR THE SITE; AND THE CONSTRUCTION AND CLOSURE OF WELLS SHALL COMPLY WITH APPROPRIATE FEDERAL AND STATE ARARS. MAXIMUM CONTAMINANT LEVELS (MCLS) FOR GROUNDWATER REMEDIATION WILL NOT BE MET IN THIS INTERIM ACTION, HOWEVER, THEY WILL BE ADDRESSED IN THE FINAL REMEDIATION OF THE GROUNDWATER.

8.3 ALTERNATIVE 3 - RELIEF FROM WATER INFILTRATION AND RECOVERY SYSTEM MODIFICATION

ESTIMATED CAPITAL COST:	$ 660,000
ESTIMATED OPERATION AND MAINTENANCE (O&M):	$ 83,000
MONTHS TO IMPLEMENT:	4 MONTHS

THIS ALTERNATIVE INCLUDES ALL ITEMS DISCUSSED IN ALTERNATIVE 2 AND INCLUDES THE MODIFICATION OF THE CURRENT OIL RECOVERY SYSTEM TO INCREASE THE AMOUNT OF OIL RECOVERED. FDER HAS HIRED A LOCAL CONTRACTOR TO DISPOSE OF THE OIL AT A RECYCLING FACILITY. THE PURPOSE OF CLOSING OUT THE DAMAGED WELLS AND DRAINAGE SYSTEM IS TO PREVENT THE POSSIBLE INCREASE IN CONTAMINATION AND MIGRATION OF CONTAMINANTS FROM THE SITE. MANY OF THE DRAINAGE WELLS ARE FROM 42 TO 75 FEET IN DEPTH. WITH THESE WELLS OPEN TO THE AQUIFER, CONTAMINATION OF THE DRINKING WATER AND GROUNDWATER IS POSSIBLE. THE EXACT MODIFICATION TO THE PRESENT SYSTEM HAS NOT BEEN INVESTIGATED

AT THIS TIME ALTHOUGH THIS COULD BE ACCOMPLISHED DURING THE REMEDIAL DESIGN PHASE. MODIFYING THE PRESENT OIL RECOVERY SYSTEM SHOULD BE AN EASILY IMPLEMENTED INTERIM ACTION.

INCREASING THE OIL RECOVERY SYSTEM SHOULD AID IN THE CAPTURE OF WASTE OIL FROM THE GROUNDWATER. THESE RECOVERY WELLS COULD BE UTILIZED IN THE FUTURE IN THE EVENT THAT A LARGE SCALE GROUNDWATER PUMP AND TREAT SYSTEM IS TO BE CONSTRUCTED ON-SITE. ALSO, THE WELLS COULD BE USED AS A MONITORING LOCATION FOR GROUNDWATER CONTAMINATION IN THE AREA.

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9.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A DETAILED ANALYSIS WAS PERFORMED ON THE THREE ALTERNATIVES USING THE NINE EVALUATION CRITERIA IN ORDER TO SELECT A SITE REMEDY. THE FOLLOWING IS A DEFINITION AND BRIEF SUMMARY OF EACH ALTERNATIVES' STRENGTHS AND WEAKNESSES WITH RESPECT TO THE NINE EVALUATION CRITERIA. THESE NINE CRITERIA ARE: 1) OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT; 2) COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS); 3) SHORT-TERM EFFECTIVENESS; 4) LONG-TERM EFFECTIVENESS AND PERMANENCE; 5) COST; 6) REDUCTION OF TOXICITY, MOBILITY AND VOLUME; 7) IMPLEMENTABILITY; 8) STATE ACCEPTANCE; AND 9) COMMUNITY ACCEPTANCE.

OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT ADDRESSES WHETHER A REMEDY PROVIDES ADEQUATE PROTECTION AND DESCRIBES HOW RISKS POSED THROUGH EACH PATHWAY ARE ELIMINATED, REDUCED OR CONTROLLED THROUGH TREATMENT, ENGINEERING CONTROLS OR INSTITUTIONAL CONTROLS.

COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) ADDRESSES WHETHER A REMEDY WILL MEET ALL OF THE ARARS OF OTHER FEDERAL AND STATE ENVIRONMENTAL LAWS AND/OR JUSTIFIES A WAIVER.

LONG-TERM EFFECTIVENESS AND PERMANENCE REFERS TO EXPECTED RESIDUAL RISK AND THE ABILITY OF A REMEDY TO MAINTAIN RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OVER TIME, ONCE CLEAN-UP GOALS HAVE BEEN MET.

REDUCTION OF TOXICITY, MOBILITY OR VOLUME THROUGH TREATMENT IS THE ANTICIPATED PERFORMANCE OF THE TREATMENT TECHNOLOGIES A REMEDY MAY EMPLOY.

SHORT-TERM EFFECTIVENESS ADDRESSES THE PERIOD OF TIME NEEDED TO ACHIEVE PROTECTION AND ANY ADVERSE IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT THAT MAY BE POSED DURING THE CONSTRUCTION AND IMPLEMENTATION PERIOD, UNTIL CLEANUP GOALS ARE ACHIEVED.

IMPLEMENTABILITY IS THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY, INCLUDING THE AVAILABILITY OF MATERIALS AND SERVICES NEEDED TO IMPLEMENT A PARTICULAR OPTION.

COST INCLUDES ESTIMATED CAPITAL AND O&M COSTS, AS WELL AS PRESENT-WORTH COSTS.

STATE/SUPPORT AGENCY ACCEPTANCE INDICATES WHETHER, BASED ON ITS REVIEW OF THE RI AND PROPOSED PLAN, EPA AND FDER AGREE ON THE PREFERRED ALTERNATIVE.

COMMUNITY ACCEPTANCE INDICATES THE PUBLIC SUPPORT OF A GIVEN ALTERNATIVE.

OVERALL PROTECTION.

ALL OF THE ALTERNATIVES, WITH THE EXCEPTION OF THE "NO ACTION" ALTERNATIVE, WOULD PROVIDE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT BY REDUCING RISK THROUGH ENGINEERING CONTROLS OR INSTITUTIONAL CONTROLS. ALTERNATIVES 2 & 3 OFFER REDUCTION OF CONTAMINANTS INTO THE GROUNDWATER BY REMOVING THE INFILTRATION INTO THE AQUIFER OF RUN-OFF FROM ON-SITE BUSINESSES AND RAINFALL.

BECAUSE THE "NO-ACTION" ALTERNATIVE OFFERS NO REDUCTION IN RISK TO HUMAN HEALTH AND THE ENVIRONMENT, IT IS NOT CONSIDERED FURTHER IN THIS ANALYSIS AS AN OPTION FOR THIS SITE.

LONG-TERM EFFECTIVENESS AND PERMANENCE.

NONE OF THE ALTERNATIVES PROVIDES FOR A LONG-TERM REMEDY IN THAT THE GOAL OF THE INTERIM ACTION IS TO CONTAIN CONTAMINANT MIGRATION PRIOR TO IMPLEMENTING THE LARGE SCALE REMEDY TO FOLLOW AT A LATER DATE.

SHORT-TERM EFFECTIVENESS.

THERE SHOULD BE NO ADVERSE EFFECTS TO HUMAN HEALTH AND THE ENVIRONMENT FROM EITHER OF THE ALTERNATIVES UNDER CONSIDERATION. THE SHORT-TERM EFFECT WILL BE TO ADDRESS THE REMOVAL OF THE WASTE OIL FROM THE GROUNDWATER AND PREVENTION OF PLUME MIGRATION IN ALTERNATIVE 3 UNTIL A FINAL REMEDY IS UNDERTAKEN.

IMPLEMENTABILITY

ALL ALTERNATIVES ARE EASILY IMPLEMENTED FOR THE SITE. THERE SHOULD BE NO PROBLEM IN SECURING THE EQUIPMENT AND MATERIALS FOR THE DECOMMISSIONING OF WELLS AND MODIFICATION TO THE PRESENT RECOVERY SYSTEM AS STATED IN ALTERNATIVE 3.

COMMUNITY ACCEPTANCE.

COMMUNITY ACCEPTANCE OF THE PREFERRED ALTERNATIVE HAS BEEN VERY POSITIVE. DURING THE PUBLIC MEETING, MANY OF THE RESIDENTS AND LOCAL OFFICIALS AGREED WITH ALTERNATIVE 3 AS AN APPROPRIATE REMEDY FOR THE INTERIM ACTION.

COMPLIANCE WITH ARARS.

THERE ARE VERY FEW ARARS THAT ARE ASSOCIATED WITH WILL BE MET IN THE INITIATION OF EITHER OF THE REMEDIES. NO MCLS WILL BE MET. THE ALTERNATIVES ARE ONLY CONTAINMENT REMEDIES; NOT A FINAL REMEDY FOR THE SITE. FEDERAL AND STATE REGULATIONS IN REGARD TO THE CLOSURE AND CONSTRUCTION OF WELLS, IMPLEMENTATION OF DRAINAGE SYSTEMS AND TRANSPORTATION AND DISPOSAL OF RECOVERED WASTE OILS WILL BE ADDRESSED BY BOTH ALTERNATIVES.

OF THE ABOVE CRITERIA, THE FOLLOWING APPLY IN LIMITED CAPACITY TO THE INTERIM ACTION RECORD OF DECISION: 1) OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT; 2) COMPLIANCE WITH ARARS; 3) REDUCTION OF TOXICITY, MOBILITY OR VOLUME THROUGH TREATMENT; 4) IMPLEMENTABILITY; 5) COSTS; 6) STATE ACCEPTANCE; AND 7) COMMUNITY ACCEPTANCE. ALL ARARS WILL NOT BE MET SINCE THE CONTAINMENT OF THE CONTAMINATION PLUME IS THE PRIMARY GOAL OF THE REMEDY FOR THIS ACTION. THERE IS NO LONG-TERM OR SHORT-TERM EFFECTIVENESS TO BE ADDRESSED WITH THIS INTERIM ACTION. ALL OF THE NINE CRITERIA WILL BE ADDRESSED TO THE FULLEST EXTENT IN THE FINAL REMEDY. THE INTERIM ACTION IS NOT MEANT TO ADDRESS THE FINAL CLEANUP OF THE SITE NOR IS THE INTENT TO ADDRESS CLEAN-UP STANDARDS OR REGULATIONS IN REGARD TO GROUNDWATER. THIS REMEDY MITIGATES A THREAT POSED BY THE POTENTIAL MIGRATION OF THE PLUME INTO DRINKING WATER WELLS AND LIMITING THE ENVIRONMENTAL FACTORS THAT CONTRIBUTE TO PLUME MIGRATION.

ALTERNATIVE 3 IS THE MOST COST-EFFECTIVE ALTERNATIVE THAT EFFECTIVELY PROVIDES PROTECTION TO PUBLIC HEALTH AND THE ENVIRONMENT AT THIS TIME. THERE ARE FEW ARARS TO BE MET BY THIS ALTERNATIVE OR ANY OF THE OTHER ALTERNATIVES PRESENTED. THERE IS A REDUCTION IN MOBILITY OF THE CONTAMINATION PLUME WHICH WOULD OCCUR FROM THE LIMITING OF THE GROUNDWATER AS WELL AS RAINWATER TO FLOW NEAR THE CONTAMINATED SOILS IN THE AREA OF THE DISPOSAL PIT LOCATIONS. ALTERNATIVE 3 IS THE ONLY ALTERNATIVE THAT PROVIDES FOR A MODIFICATION TO THE PRESENT OIL RECOVERY SYSTEM WHICH

WOULD DECREASE THE POTENTIAL FOR THE CONTAMINATION TO MIGRATE OFF-SITE AND INTO THE WELL FIELDS NEARBY.

AS STATED PREVIOUSLY THIS INTERIM ACTION ALTERNATIVE ADDRESSES THE PLUME MIGRATION AND FACTORS THAT ENHANCE THE MIGRATION OF CONTAMINANTS AWAY FROM THE SITE.

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10.0 THE SELECTED REMEDY

ALTERNATIVE #3 HAS BEEN SELECTED AS THE APPROPRIATE REMEDY FOR THE SITE AS AN INTERIM REMEDIAL ACTION. THIS FIRST OPERABLE UNIT ADDRESSES THE CONTAINMENT OF THE CONTAMINATION UNTIL THE TIME THAT EPA AND FDER HAS HAD THE OPPORTUNITY TO EVALUATE AND TEST ALTERNATIVES FOR SOURCE CONTROL AT THE SITE. THE SELECTED REMEDY IS TO DECOMMISSION THE NON-OPERATING WELLS THAT REMAIN ON-SITE, CLOSE OUT THE STORM DRAINAGE WELLS THAT ARE ON-SITE WHICH DEPOSIT WASTEWATER AND STORMWATERS IN TO THE LOWER ZONE OF THE BISCAYNE AQUIFER, CONDUCT A PRIVATE WATER WELL SURVEY TO IDENTIFY PRESENT USERS OF THE GROUNDWATER IN THE AFFECTED AREA, AND MODIFY THE PRESENT RECOVERY SYSTEM IN AN EFFORT TO REMOVE A LARGER VOLUME OF OIL FROM THE GROUNDWATER AND CONTAIN THE PLUME. SPECIFIC DESIGN PROTOCOLS AND CRITERIA WILL BE DETERMINED BY BENCH SCALE OR PILOT TESTING DURING THE REMEDIAL DESIGN. THIS REMEDY WILL ONLY ADDRESS THE CONTINUED RELEASE OF CONTAMINATION INTO THE GROUNDWATER THROUGH INFILTRATION OF WASTEWATER AND FLUSHING OF THE CONTAMINANTS INTO THE GROUNDWATER FROM DRAINAGE WELLS AND DRAINAGE SYSTEMS AT THE SITE. OPERABLE UNIT TWO WILL ADDRESS SOURCE CONTROL OF THE CONTAMINATION AT THE SITE AND FINAL GROUNDWATER ACTION.

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11.0 STATUTORY DETERMINATIONS

EPA HAD DETERMINED THAT THIS INTERIM REMEDY WILL NOT SATISFY ALL OF THE STATUTORY REQUIREMENTS OF PROVIDING PERMANENT PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT, OR ATTAINING APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS OF OTHER ENVIRONMENTAL STATUTES. HOWEVER, THIS INTERIM REMEDY WILL LIMIT THE CONTINUED MIGRATION OF CONTAMINANTS INTO THE GROUNDWATER AND WILL UTILIZE RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE. AN INTERIM REMEDY WAIVER IS REQUESTED FOR THIS SITE. THE FINAL REMEDY WILL COMPLY WITH THE ARARS FOR THE SITE.